Environmental Health Information

ValAdCo Livestock Feeding Operation

July 2003

This information sheet provides general information about the public health issues associated with a livestock feeding operation – for people living near the operation and members of the public. It does not provide a comprehensive discussion of all available technical information about the site, or of all health issues possibly related to the site. More detailed information can be found in the draft Public Health Assessment report for the site (July 2003), which is available from the Minnesota Department of Health (MDH).

Site description and history

ValAdCo is a cooperatively owned hog production business with seven separate facilities located near the towns of Renville and Olivia, in Renville County, in southwestern Minnesota. The various facilities began operations between 1993 and 1995. The ValAdCo facility locations and brief descriptions are shown on page 5 and 6.

At each of the facilities, hogs are housed in barns that have slatted floors through which animal wastes and water flow to open-air settling ponds or lagoons. Large amounts of water are added to the waste to create a slurry, making it easier to move and to aid in bacterial breakdown of the waste. The waste is held in the lagoons until it can be spread on farm fields in the late summer and fall. Except for the Commercial Nursery, where the holding basins are completely pumped out every year, only about two to six million gallons are pumped from the lagoons at a given facility. A minimum level of water and waste must be kept in the lagoons to protect the clay liners from freezing or drying out. The waste and water mixture in the lagoons also helps to maintain the bacterial systems that break down the waste.

Local residents began to send complaints to county and state agencies about odor and health concerns soon after operations began. Many of the complaints were about conditions at the two Norfolk Township facilities. Air monitoring by state agencies at the Norfolk 27 facility showed repeated violations of the Minnesota Ambient Air Quality Standard (MAAQS) for hydrogen sulfide (H_2S).

In response to citizen complaints and requests from the Minnesota Pollution Control Agency (MPCA), ValAdCo tested a variety of methods to reduce odors with little success. In 2001, the lagoons were completely covered and the Norfolk 27 facility was fitted with a device to destroy the odorous lagoon gases by treating the gases with ozone. Odor complaints decreased, but some violations of the MAAQS still occurred.

As required by their permit, four of the ValAdCo facilities (Norfolk 29, Norfolk 27, Flora 5, and Emmet 31) have monitoring wells to evaluate whether leakage may be occurring from the waste storage lagoons. Three of the facilities (Norfolk 29, Norfolk 27, and Emmet 31) also monitor tile lines around the perimeter of the lagoons for the same reason. Surface water samples have also been collected from the county ditches near the two Norfolk Township facilities.

In May of 2001, the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) received a citizen petition for a Public Health Assessment for the ValAdCo facilities in Norfolk Township, Minnesota. The petition specifically cites air and water quality concerns. In August 2001, the ATSDR asked the Minnesota Department of Health (MDH) to conduct the health assessment.

Residents also identified dead animal disposal as a concern during a site visit, but no specific information was available to allow for assessment of potential exposures to public health hazards associated with dead animals.

The ValAdCo properties were purchased in late 2002 by Christensen Family, LLC (CFL). In the spring and summer of 2003, CFL upgraded waste storage at six of the facilities and undertook actions to address some of the recommendations contained in the Public Health Assessment. Specifically, they: upgraded the waste storage lagoons to reduce air emissions; installed monitoring wells at the facility in Crooks Township Section 29; and upgraded the dead animal storage boxes to prevent access of scavengers.

What contaminants have been found and where?

The air quality data show that residents near the Norfolk 27 facility have been exposed to levels of hydrogen sulfide that exceed state air quality and health standards. Air monitoring occurred mainly at the property boundaries of the facilities. There were not enough data to evaluate levels of exposure at residential properties near the facility. However, physical symptoms reported by residents are consistent with exposure to elevated levels of hydrogen sulfide and suggest that adverse health effects may have occurred as a result of these exposures.

There are very limited data for air emissions at the other ValAdCo sites. However, it is possible that violations of the MAAQS may have occurred at these facilities. Additional monitoring would be required to determine whether the other ValAdCo facilities pose a health risk.

Some evidence of leakage from the waste storage lagoons was identified at three facilities (Norfolk 27, Flora 5, and Emmet 31), but no evidence was found that residents have been exposed to the contaminated groundwater from these facilities. Monitoring wells at these facilities showed: elevated levels of chloride, and occasional elevated concentrations of nitrate and bacteria

MDH review of manure management raised questions regarding the rate of application of waste from the facilities. Animal waste contains high concentrations of nutrients, bacteria, and viruses that may contaminate surface and groundwater systems if not applied correctly. There is not adequate surface water or groundwater monitoring data near the land application areas to determine if this has occurred.

Other potential risks to groundwater and drinking water were noted. In several cases, there were no data that could be used to determine whether these conditions had led to actual contamination of the water. For example, several improperly abandoned wells

were located in land application areas. Also, historic evidence of other old wells was found, though the actual wells could not be located. Any of these old wells could provide a way for contamination to enter the groundwater, but there is no information to determine if this has occurred.

Another potential source of contamination is the location of Crooks 29 lagoons within the Drinking Water Supply Management Area for the Renville City wells #5 and #6, and near shallow residential wells. No groundwater sampling has been done to determine whether contamination exists near Crooks 29. The city water system is sampled regularly for bacteria, nitrates, and other compounds that might be related to agricultural contamination. Bacteria have not been detected in the city system, and only very low concentrations of nitrate are occasionally detected. However, there are no individual water samples collected from wells #5 or #6.

Another area of concern is that several ValAdCo facilities have shallow water supply wells that may act as a potential source of contamination for workers at the facilities. Again, no monitoring data are available for those wells

Could I be exposed to contaminants?
The main health concern at the facilities is air emissions. Residents living near the facilities may be exposed to levels of hydrogen sulfide above health standards. Actual exposures depend on meteorological factors, including wind direction and the distance residents live from the facility. It is unknown how much the changes in the facility operations proposed by the new owner, Christensen Farms, may reduce or eliminate these air emissions.

Limited monitoring at the facilities does not indicate that serious contamination of the groundwater has occurred as a result of leakage from the lagoons. It is unlikely that anyone has been exposed to contamination from this source. However, the MDH recommends that anyone who owns a private water supply well have it tested annually for bacteria and nitrate. A low-cost testing kit can be obtained from the Renville County Public Health office. For more information, call 320-523-2570.

There is not enough information to determine whether nutrients or bacteria entering abandoned wells in fields where waste is land-applied have contaminated groundwater. Nor is there sufficient information to know if surface waters in the area have been contaminated by runoff from land application areas. As a result, it is not possible to determine if anyone could be exposed to contamination through groundwater or surface water.

What is being done about the public health hazards associated with the site?
On December 21, 2002, it was announced that the ValAdCo facilities had been purchased by Christensen Farms Corporation. Christensen Farms intends to upgrade the waste storage systems at six of the facilities by replacing the primary clay-lined lagoons with covered, circular, concrete-lined lagoons. The remaining lagoon will be used as a secondary settling pond. Waste from the existing lagoons will be removed

and disposed of properly. Construction of the new waste storage lagoons began in the spring of 2003. The new waste storage systems are expected to reduce odors and hydrogen sulfide emissions. The MDH has recommended that compliance with air quality standards be verified by air monitoring at the facilities.

Conclusions

The air emissions from the ValAdCo Norfolk 27 facility are a public health concern. Hydrogen sulfide concentrations have been found to exceed the MAAQS. Symptoms reported by neighbors are consistent with air monitoring data.

Exposures to toxic air contaminants are episodic and acute (happening for short periods of time), and symptoms rapidly disappear. However, there may possibly be other, more subtle but long lasting effects from repeated short periods of exposure. These health concerns may also be associated with other facilities, but data are lacking. The new storage structures should help to alleviate concerns about toxic emissions, but this should be verified by air monitoring.

There is evidence that leakage has occurred from some of the storage lagoons, but the contaminants detected do not exceed any health risk limits and they do not appear to be affecting nearby residential wells. Other pathways may exist for contamination to enter the groundwater, but there is not enough information to determine if this has occurred. Additional site investigation would be necessary to determine whether completed exposure pathways exist in the groundwater and surface water, and to determine whether these exposures are associated with the ValAdCo facilities or are part of a more widespread problem associated with general agricultural activities in the study area.

Likewise, there is not enough information to determine whether land application of wastes or dead animal disposal activities pose a public health risk.

What does MDH recommend?

For groundwater:

Groundwater monitoring wells be installed at the facility located near the Renville city wells;
Renville city wells #5 and #6 each be tested annually for bacteria and nitrate;
Groundwater monitoring wells be installed at the Crooks 34 facility, and:
Water supply wells at all of the facilities be tested to ensure safe drinking water for workers and animals.

For land application of wastes:

Aerial photo reviews be conducted for all land application sites before waste spreading occurs, to identify any possible abandoned wells, and;
The chemistry of the waste and land application area soils should be better characterized by sampling before the waste is spread.

For surface water:

Ditches near the facilities and land application sites should be tested for bacteria and nutrients.

For dead animal storage:

Storage containers for dead animals should be constructed to prevent access by scavengers.

A complete copy of the Public Health Assessment for the ValAdCo Livestock Feeding Operation is available from MDH. To request copies call Tannie Eshenaur at 651-215-0916, toll-free 1800-657-3908, press #4. Or, visit our website at www.health.state.mn.us. Upon request, this publication can be made available in alternative formats. Call (651) 215-0700 or TDD (651) 215-0707.

This information sheet was prepared in cooperation with the U.S. Agency for Toxic Substances and Disease Registry. Printed on recycled paper.

ValAdCo facilities with brief description of operation

Crooks 34 (Breeding, Gestation, and Farrowing): Located in the southwest quarter of Section 34 in Crooks Township, Crooks 34 houses up to 1,248 sows and 66 boars, and has two lagoons with a total waste storage capacity of approximately 6.5 million gallons. The facility began operations in 1993.

Crooks 29 (Nursery and Finishing): Located in the southeast quarter of Section 29 in Crooks Township, Crooks 29 houses 3,840 nursery pigs and 3,840 finishing hogs, and has two lagoons with a total waste storage capacity of approximately 17.6 million gallons. The facility began operations in 1993.

Norfolk 29 (Breeding, Gestation, and Farrowing): Located in the northeast quarter of Section 29 in Norfolk Township, Norfolk 29 houses 2,316 gilts, 480 sows, and 130 boars, and has two lagoons with a total waste storage capacity of approximately 25.9 million gallons (Figure 7). The facility began operations in 1994.

Norfolk 27 (Nursery and Finishing): Located in the northwest quarter of Section 27 in Norfolk Township, Norfolk 27 houses 7,680 nursery pigs, 2,880 grower/feeder pigs, and 4,800 finishing hogs, and has two lagoons with a total waste storage capacity of approximately 36 million gallons. The facility began operations in 1994.

Flora 5: Located in the southwest quarter of Section 5 in Flora Township, Flora 5 houses 5,760 nursery pigs, 480 sows, 2,116 gilts, and 130 boars, and has two lagoons with a total waste storage capacity of approximately 26.7 million gallons. This facility began operations in 1995.

Emmet 31 (Breeding, Gestation and Farrowing): Located in the southwest quarter of Section 31 in Emmet Township, Emmet 31 houses 5,760 nursery pigs, 480 sows, 2,116

gilts, and 130 boars, and has two lagoons with a total waste storage capacity of approximately 26 million gallons. The facility began operations in 1995.

Flora 7 (Commercial Nursery): Located in the southeast quarter of Section 7 in Flora Township, Flora 7 houses 15,360 nursery pigs and has two earthen basins with a total waste storage capacity of approximately 4 million gallons. The facility began operations in 1996.